

CLAIMS

I/We claim:

1. A method of processing a packaged microelectronic component, comprising:
heating the packaged microelectronic component to a reflow temperature of a selected solder;
after the heated packaged microelectronic component has cooled to a temperature below the reflow temperature, applying the selected solder to contacts carried by the cooled packaged microelectronic component;
testing performance of the solder-bearing packaged microelectronic component; and
rejecting as defective any packaged microelectronic component that fails to meet minimum performance criteria in the performance testing.
2. The method of claim 1 wherein heating the packaged microelectronic component comprises heating the packaged microelectronic component at a rate of at least about 5°C/second.
3. The method of claim 1 wherein heating the packaged microelectronic component comprises heating the packaged microelectronic component at a rate of at least about 8°C/second.
4. The method of claim 1 wherein heating the packaged microelectronic component comprises heating the packaged microelectronic component at a ramp rate greater than a ramp rate at which the packaged microelectronic component will be heated in a subsequent solder reflow operation.

5. The method of claim 1 wherein heating the packaged microelectronic component further comprises heating the packaged microelectronic component to a temperature greater than the reflow temperature.
6. The method of claim 1 wherein heating the packaged microelectronic component comprises heating the packaged microelectronic component to a temperature of about 215-230°C.
7. The method of claim 1 wherein heating the packaged microelectronic component comprises heating the packaged microelectronic component to a temperature of at least about 220°C.
8. The method of claim 1 wherein the testing comprises heating the microelectronic component to an elevated test temperature that is below the reflow temperature.
9. The method of claim 1 wherein the testing is conducted after the solder is applied to the contacts and the testing comprises heating the microelectronic component to an elevated test temperature that is below the reflow temperature.
10. The method of claim 1 wherein the packaged microelectronic component is heated to the reflow temperature in a heating chamber operatively associated with a solder plating apparatus used to apply the solder.
11. The method of claim 10 wherein the packaged microelectronic component is transferred directly from the heating chamber to the solder plating apparatus.

12. The method of claim 1 wherein the packaged microelectronic component is removed from a magazine carrying a plurality of other microelectronic components before heating the packaged microelectronic component to the reflow temperature.
13. The method of claim 1 wherein the packaged microelectronic component is mounted on a mounting tape, heating the packaged microelectronic component comprising heating the packaged microelectronic component and the tape.
14. The method of claim 1 wherein the packaged microelectronic component is mounted on a mounting tape, heating the packaged microelectronic component comprising heating the packaged microelectronic component and the tape, the packaged microelectronic component being removed from the mounting tape prior to the performance testing.
15. A method of processing packaged microelectronic components, comprising:
heating a plurality of packaged microelectronic components to a stress temperature of at least about 215°C;
thereafter, applying a solder to contacts carried by each of the packaged microelectronic components;
testing performance of the solder-bearing packaged microelectronic components; and
rejecting as defective any packaged microelectronic component that fails to meet minimum performance criteria in the performance testing.
16. The method of claim 15 wherein heating the packaged microelectronic components comprises heating the packaged microelectronic components at a rate of at least about 5°C/second.

17. The method of claim 15 wherein heating the packaged microelectronic components comprises heating the packaged microelectronic components at a rate of at least about 8°C/second.
18. The method of claim 15 wherein heating the packaged microelectronic components comprises heating the packaged microelectronic components at a ramp rate greater than a ramp rate at which the packaged microelectronic components will be heated in a subsequent solder reflow operation.
19. The method of claim 15 wherein heating the packaged microelectronic components comprises heating the packaged microelectronic components to a temperature of about 215-230°C.
20. The method of claim 15 wherein heating the packaged microelectronic components comprises heating the packaged microelectronic components to a temperature of at least about 220°C.
21. The method of claim 15 wherein the testing comprises heating the microelectronic components to an elevated test temperature that is below 150°C.
22. The method of claim 15 wherein the testing is conducted after the solder is applied to the contacts and the testing comprises heating the microelectronic components to an elevated test temperature that is below 150°C.
23. The method of claim 15 wherein the packaged microelectronic components are heated in a heating chamber operatively associated with a solder plating apparatus used to apply the solder.

24. The method of claim 23 wherein the packaged microelectronic components are transferred directly from the heating chamber to the solder plating apparatus.
25. The method of claim 15 wherein the packaged microelectronic components are initially carried in a magazine and the packaged microelectronic components are removed from the magazine before the heating of the packaged microelectronic components.
26. The method of claim 15 wherein at least two of the packaged microelectronic components are mounted on a common length of mounting tape, heating the packaged microelectronic components comprising heating the packaged microelectronic components and the tape.
27. The method of claim 15 wherein at least two of the packaged microelectronic components are mounted on a common length of mounting tape, heating the packaged microelectronic components comprising heating the packaged microelectronic components and the tape, the packaged microelectronic components being removed from the mounting tape prior to the performance testing.
28. A system for processing packaged microelectronic components, comprising:
a first loading station adapted to receive a first magazine containing a plurality of packaged microelectronic components;
a heating apparatus adapted to heat the packaged microelectronic components to a reflow temperature of a selected solder, the first loading station being adapted to transfer the packaged microelectronic components out of the first magazine and to the heating apparatus;

a solder plating apparatus adapted to receive the packaged microelectronic components from the heating system, the solder plating apparatus being adapted to deposit the selected solder on contacts of the packaged microelectronic components; and

a second loading station adapted to transfer the packaged microelectronic components from the solder plating apparatus to a second magazine.

29. The system of claim 28 wherein the heating apparatus comprises a heating zone adapted to heat the packaged microelectronic components at a rate of at least about 5°C/second.
30. The system of claim 28 wherein the heating apparatus comprises a heating zone adapted to heat the packaged microelectronic components at a rate of at least about 8°C/second.
31. The system of claim 28 wherein the heating apparatus comprises a heating zone maintained at a temperature of at least about 350°C.
32. The system of claim 28 wherein the heating apparatus comprises a heating zone and a cooling zone, the cooling zone being disposed between the heating zone and the solder plating apparatus.
33. The system of claim 28 wherein the heating apparatus comprises an oven chamber and a transport system adapted to transport the packaged microelectronic components single-file through the oven chamber.
34. A system for processing microelectronic components, comprising:
a cure station adapted to receive a first magazine carrying plurality of microelectronic components, each of which includes a curable

- encapsulant, the cure station being adapted to cure the curable encapsulant by heating the microelectronic components to an encapsulant cure temperature in the first magazine ;
- a pre-solder heating apparatus adapted to heat the packaged microelectronic components to a reflow temperature of a selected solder, the reflow temperature being greater than the encapsulant cure temperature;
 - a first transport adapted to transport the magazine of cured microelectronic components from the cure station to the pre-solder heating apparatus and transfer the cured microelectronic components out of the first magazine and to the pre-solder heating apparatus;
 - a solder plating apparatus adapted to receive the microelectronic components from the pre-solder heating apparatus, the solder plating apparatus being adapted to deposit the selected solder on contacts of the microelectronic components;
 - a testing system adapted to test performance of the solder-bearing microelectronic components; and
 - a second transport adapted to transfer the microelectronic components from the solder plating apparatus to a second magazine and transport the second magazine for further processing.
35. The system of claim 34 wherein the pre-solder heating apparatus comprises a heating zone adapted to heat the microelectronic components at a rate of at least about 5°C/second.
36. The system of claim 34 wherein the pre-solder heating apparatus comprises a heating zone adapted to heat the microelectronic components at a rate of at least about 8°C/second.

37. The system of claim 34 wherein the pre-solder heating apparatus comprises a heating zone maintained at a temperature of at least about 350°C.
38. The system of claim 34 wherein the pre-solder heating apparatus comprises a heating zone and a cooling zone, the cooling zone being disposed between the heating zone and the solder plating apparatus.
39. The system of claim 34 wherein the pre-solder heating apparatus comprises an oven chamber and a transport system adapted to transport the microelectronic components single-file through the oven chamber.